

IN THE CLAIMS:

Please amend the claims as follows:

Claim 1 (Original): An alkali metal generating agent as a supply source of an alkali metal used in formation of a photo-cathode for emitting a photoelectron corresponding to incident light or a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said alkali metal generating agent comprising:
an oxidizer comprising at least one tungstate with an alkali metal ion as a counter cation;
and

a reducer for initiating a redox reaction with the oxidizer at a predetermined temperature to reduce the alkali metal ion,
wherein the substance amount ratio of the reducer with respect to the tungstate is 1.9 or more but 50.1 or less.

Claims 2-5 (Cancelled)

Claim 6 (Previously Presented): An alkali metal generating agent according to claim 1, wherein the reducer is at least one selected from the group consisting of Si, Zr, Ti, and Al.

Claim 7 (Previously Presented): An alkali metal generating agent according to claim 1, wherein the tungstate is expressed by a chemical formula R_2WO_4 , where R is at least one metal element selected from the group consisting of Na, Ka, Rb and Cs.

Claim 8 (Previously Presented): An alkali metal generating agent according to claim 1, the alkali metal generating agent being of a powder form.

Claim 9 (Previously Presented): An alkali metal generating agent according to claim 1, the alkali metal generating agent being formed in a pellet form having a predetermined shape by compression molding.

Claim 10 (Previously Presented): An alkali metal generating device for generating an alkali metal used in formation of a photo-cathode for emitting a photoelectron corresponding to incident light or a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said alkali metal generating device comprising:

a case;

a supply source housed in the case and comprising an alkali metal generating agent according to claim 1; and

a discharge port provided in the case and adapted for discharging a vapor of the alkali metal generated in the supply source, from an interior space of the case housing the supply source, toward the exterior of the case.

Claim 11 (Original): An alkali metal generating device according to claim 10, wherein the case is made of a metal.

Claim 12 (Previously Presented): An alkali metal generating device according to claim 10, wherein the case comprises:

a hollow container of a metal having apertures at both ends and provided with the discharge port in a side face thereof; and
lid members of a metal covering the respective apertures at the both ends of the hollow container.

Claim 13 (Previously Presented): An alkali metal generating device according to claim 10, wherein the case is a hollow container of a metal having apertures at both ends thereof, wherein the apertures at the both ends of the hollow container are hermetically closed in a state in which the hollow container secures an interior space for housing the alkali metal generating agent, and

wherein the discharge port is provided in at least one of the both ends of the hollow container hermetically closed.

Claim 14 (Previously Presented): An alkali metal generating device according to claim 10, wherein the alkali metal generating agent is formed in a pellet form having a predetermined shape,

wherein the case is comprised of a closed-end container of a metal having a recess for housing the alkali metal generating agent, and a lid member of a metal welded to the closed-end container in a state in which the lid member covers an aperture of the recess, and

wherein the discharge port of the case is formed in a non-welded portion between the closed-end container and the lid member.

Claim 15 (Previously Presented): An alkali metal generating device according to claim 10, further comprising a glass ampule housing the entire case.

Claim 16 (Previously Presented): An alkali metal generating device according to claim 10, further comprising a heating device for initiating the redox reaction of the alkali metal generating agent to generate the vapor of the alkali metal.

Claim 17 (Original): An alkali metal generating device according to claim 16, wherein the heating device comprises a high-frequency supply for heating the alkali metal generating agent by high-frequency heating.

Claim 18 (Previously Presented) A photo-cathode for emitting a photoelectron corresponding to incident light, said photo-cathode comprising the alkali metal generated from an alkali metal generating agent according to claim 1.

Claim 19 (Previously Presented): A photo-cathode for emitting a photoelectron corresponding to incident light, said photo-cathode comprising the alkali metal generated from an alkali metal generating device according to claim 10.

Claim 20 (Previously Presented): A secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said secondary-electron emitting surface comprising the alkali metal generated from an alkali metal generating agent according to claim 1.

Claim 21 (Previously Presented): A secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said secondary-electron emitting surface comprising the alkali metal generated from an alkali metal generating device according to claim 10.

Claim 22 (Previously Presented): An electron tube comprising a photo-cathode according to claim 18.

Claim 23 (Original) An electron tube according to claim 22, further comprising: an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface for emitting secondary electrons in accordance with incidence of the photoelectron emitted from the photo-cathode; and an anode for collecting the secondary electrons outputted from the electron multiplying part and extracting the collected secondary electrons as an electric current to the outside.

Claim 24 (Original): An electron tube according to claim 22, further comprising: an anode for collecting the photoelectron emitted from the photo-cathode and extracting the collected photoelectron as an electric current to the outside.

Claim 25 (Original): An electron tube according to claim 22, said electron tube comprising an image tube having at least a fluorescent screen for converting the photoelectron emitted from the photo-cathode, into light.

Claim 26 (Original): An electron tube according to claim 22, further comprising a streak tube comprising:

an accelerating electrode for accelerating the photoelectron emitted from the photo-cathode;

a focusing electrode for focusing the photoelectron accelerated by the accelerating electrode;

an anode having an aperture through which the photoelectron focused by the focusing electrode can pass;

a deflecting electrode having a pair of electrode plates opposed to each other and adapted to be able to sweep the photoelectron having passed through the aperture provided in the anode, in a predetermined direction by a predetermined deflection voltage applied between the pair of electrode plates; and

a fluorescent screen for converting the photoelectron deflected by the deflecting electrode, into light.

Claim 27 (Previously Presented): An electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface according to claim 20.

Claim 28 (Original): An electron tube according to claim 27, further comprising:

a photo-cathode for emitting a photoelectron corresponding to incident light, toward the electron multiplying part; and

an anode for collecting secondary electrons emitted from the electron multiplying part and extracting the collected secondary electrons as an electric current to the outside.

Claim 29 (Previously Presented): A method of production of a photo-cathode comprising an alkali metal for emitting a photoelectron corresponding to incident light, said method comprising the steps of:

preparing an alkali metal generating agent according to claim 1, as a source of the alkali metal;

heating the alkali metal generating agent; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the photo-cathode.

Claim 30 (Previously Presented): A method of production of a photo-cathode comprising an alkali metal for emitting a photoelectron corresponding to incident light, said method comprising the steps of:

preparing an alkali metal generating device according to claim 10, as a source of the alkali metal;

heating the alkali metal generating agent housed in the case of the alkali metal generating device; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the photo-cathode.

Claim 31 (Previously Presented): A method of production of a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said method comprising the steps of:

preparing an alkali metal generating agent according to claim 1, as a source of the alkali metal;

heating the alkali metal generating agent; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the secondary-electron emitting surface.

Claim 32 (Previously Presented): A method of production of a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said method comprising the steps of:

preparing an alkali metal generating device according to claim 10, as a source of the alkali metal;

heating the alkali metal generating agent housed in the case of the alkali metal generating device; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the secondary-electron emitting surface.

Claim 33 (Previously Presented): A method of production of an electron tube comprising at least a photo-cathode comprising an alkali metal for emitting a photoelectron corresponding to incident light, said method comprising the steps of:

preparing an alkali metal generating agent according to claim 1, as a source of the alkali metal;

heating the alkali metal generating agent; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the photo-cathode.

Claim 34 (Previously Presented): A method of production of an electron tube comprising at least a photo-cathode comprising an alkali metal for emitting a photoelectron corresponding to incident light, said method comprising the steps of:

preparing an alkali metal generating device according to claim 10, as a source of the alkali metal;

heating the alkali metal generating agent housed in the case of the alkali metal generating device; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the photo-cathode.

Claim 35 (Previously Presented): A method of production of an electron tube according to claim 33, wherein said electron tube comprises one selected from a photomultiplier tube, a photo-tube, an image tube, and a streak tube.

Claim 36 (Previously Presented): A method of production of an electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said method comprising the steps of:

preparing an alkali metal generating agent according to claim 1, as a source of the alkali metal;

heating the alkali metal generating agent; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the secondary-electron emitting surface.

Claim 37 (Previously Presented): A method of production of an electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said method comprising the steps of:

preparing an alkali metal generating device according to claim 10, as a source of the alkali metal;

heating the alkali metal generating agent housed in the case of the alkali metal generating device; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the secondary-electron emitting surface.

Claim 38 (Previously Presented): A method of production of an electron tube according to claim 36, wherein said electron tube comprises one selected from a photomultiplier tube, an image tube, and a streak tube.

Claim 39 (Previously Presented): An alkali metal generating agent as a supply source of an alkali metal used in formation of a photo-cathode for emitting a photoelectron corresponding to incident light or a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said alkali metal generating agent comprising:

an oxidizer comprising at least one tungstate with an alkali metal ion as a counter cation;
and

a reducer for initiating a redox reaction with the oxidizer at a predetermined temperature to reduce the alkali metal ion,

wherein the substance amount ratio of the reducer with respect to the tungstate is 4.0 or more but 50.1 or less.

Claim 40 (Previously Presented): An alkali metal generating agent according to claim 39, wherein the reducer is at least one selected from the group consisting of Si, Zr, Ti, and Al.

Claim 41 (Previously Presented): An alkali metal generating agent according to claim 39, wherein the tungstate is expressed by a chemical formula R_2WO_4 , where R is at least one metal element selected from the group consisting of Na, Ka, Rb and Cs.

Claim 42 (Previously Presented): An alkali metal generating agent according to claim 39, the alkali metal generating agent being of a powder form.

Claim 43 (Previously Presented): An alkali metal generating agent according to claim 39, the alkali metal generating agent being formed in a pellet form having a predetermined shape by compression molding.

Claim 44 (Previously Presented): An alkali metal generating device for generating an alkali metal used in formation of a photo-cathode for emitting a photoelectron corresponding to incident light or a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said alkali metal generating device comprising:

a case;

a supply source housed in the case and comprising an alkali metal generating agent according to claim 39; and

a discharge port provided in the case and adapted for discharging a vapor of the alkali metal generated in the supply source, from an interior space of the case housing the supply source, toward the exterior of the case.

Claim 45 (Previously Presented): An alkali metal generating device according to claim 44, wherein the case is made of a metal.

Claim 46 (Previously Presented): An alkali metal generating device according to claim 44, wherein the case comprises:

a hollow container of a metal having apertures at both ends and provided with the discharge port in a side face thereof; and
lid members of a metal covering the respective apertures at the both ends of the hollow container.

Claim 47 (Previously Presented): An alkali metal generating device according to claim 44, wherein the case is a hollow container of a metal having apertures at both ends thereof, wherein the apertures at the both ends of the hollow container are hermetically closed in a state in which the hollow container secures an interior space for housing the alkali metal generating agent, and

wherein the discharge port is provided in at least one of the both ends of the hollow container hermetically closed.

Claim 48 (Previously Presented): An alkali metal generating device according to claim 44, wherein the alkali metal generating agent is formed in a pellet form having a predetermined shape,

wherein the case is comprised of a closed-end container of a metal having a recess for housing the alkali metal generating agent, and a lid member of a metal welded to the closed-end container in a state in which the lid member covers an aperture of the recess, and

wherein the discharge port of the case is formed in a non-welded portion between the closed-end container and the lid member.

Claim 49 (Previously Presented): An alkali metal generating device according to claim 44, further comprising a glass ampule housing the entire case.

Claim 50 (Previously Presented): An alkali metal generating device according to claim 44, further comprising a heating device for initiating the redox reaction of the alkali metal generating agent to generate the vapor of the alkali metal.

Claim 51 (Previously Presented): An alkali metal generating device according to claim 50, wherein the heating device comprises a high-frequency supply for heating the alkali metal generating agent by high-frequency heating.

Claim 52 (Previously Presented): A photo-cathode for emitting a photoelectron corresponding to incident light, said photo-cathode comprising the alkali metal generated from an alkali metal generating agent according to claim 39.

Claim 53 (Previously Presented): A photo-cathode for emitting a photoelectron corresponding to incident light, said photo-cathode comprising the alkali metal generated from an alkali metal generating device according to claim 44.

Claim 54 (Previously Presented): A secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said secondary-electron emitting surface comprising the alkali metal generated from an alkali metal generating agent according to claim 39.

Claim 55 (Previously Presented): A secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said secondary-electron emitting surface comprising the alkali metal generated from an alkali metal generating device according to claim 44.

Claim 56 (Previously Presented): An electron tube comprising a photo-cathode according to claim 52.

Claim 57 (Previously Presented): An electron tube according to claim 56, further comprising:

an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface for emitting secondary electrons in accordance with incidence of the photoelectron emitted from the photo-cathode; and

an anode for collecting the secondary electrons outputted from the electron multiplying part and extracting the collected secondary electrons as an electric current to the outside.

Claim 58 (Previously Presented): An electron tube according to claim 56, further comprising:

an anode for collecting the photoelectron emitted from the photo-cathode and extracting the collected photoelectron as an electric current to the outside.

Claim 59 (Previously Presented): An electron tube according to claim 56, said electron tube comprising an image tube having at least a fluorescent screen for converting the photoelectron emitted from the photo-cathode, into light.

Claim 60 (Previously Presented): An electron tube according to claim 56, further comprising a streak tube comprising:

an accelerating electrode for accelerating the photoelectron emitted from the photo-cathode;

a focusing electrode for focusing the photoelectron accelerated by the accelerating electrode;

an anode having an aperture through which the photoelectron focused by the focusing electrode can pass;

a deflecting electrode having a pair of electrode plates opposed to each other and adapted to be able to sweep the photoelectron having passed through the aperture provided in the anode, in a predetermined direction by a predetermined deflection voltage applied between the pair of electrode plates; and

a fluorescent screen for converting the photoelectron deflected by the deflecting electrode, into light.

Claim 61 (Previously Presented): An electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface according to claim 54.

Claim 62 (Previously Presented): An electron tube according to claim 61, further comprising:

a photo-cathode for emitting a photoelectron corresponding to incident light, toward the electron multiplying part; and
an anode for collecting secondary electrons emitted from the electron multiplying part and extracting the collected secondary electrons as an electric current to the outside.

Claim 63 (Previously Presented): A method of production of a photo-cathode comprising an alkali metal for emitting a photoelectron corresponding to incident light, said method comprising the steps of:

preparing an alkali metal generating agent according to claim 39, as a source of the alkali metal;
heating the alkali metal generating agent; and
guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the photo-cathode.

Claim 64 (Previously Presented): A method of production of a photo-cathode comprising an alkali metal for emitting a photoelectron corresponding to incident light, said method comprising the steps of:

preparing an alkali metal generating device according to claim 44, as a source of the alkali metal;

heating the alkali metal generating agent housed in the case of the alkali metal generating device; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the photo-cathode.

Claim 65 (Previously Presented): A method of production of a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said method comprising the steps of:

preparing an alkali metal generating agent according to claim 39, as a source of the alkali metal;

heating the alkali metal generating agent; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the secondary-electron emitting surface.

Claim 66 (Previously Presented): A method of production of a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said method comprising the steps of:

preparing an alkali metal generating device according to claim 44, as a source of the alkali metal;

heating the alkali metal generating agent housed in the case of the alkali metal generating device; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the secondary-electron emitting surface.

Claim 67 (Previously Presented): A method of production of an electron tube comprising at least a photo-cathode comprising an alkali metal for emitting a photoelectron corresponding to incident light, said method comprising the steps of:

preparing an alkali metal generating agent according to claim 39, as a source of the alkali metal;

heating the alkali metal generating agent; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the photo-cathode.

Claim 68 (Previously Presented): A method of production of an electron tube comprising at least a photo-cathode comprising an alkali metal for emitting a photoelectron corresponding to incident light, said method comprising the steps of:

preparing an alkali metal generating device according to claim 44, as a source of the alkali metal;

heating the alkali metal generating agent housed in the case of the alkali metal generating device; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the photo-cathode.

Claim 69 (Previously Presented): A method of production of an electron tube according to claim 67, wherein said electron tube comprises one selected from a photomultiplier tube, a photo-tube, an image tube, and a streak tube.

Claim 70 (Previously Presented): A method of production of an electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron emitting surface for emitting secondary electrons corresponding to an incident electron, said method comprising the steps of:

preparing an alkali metal generating agent according to claim 39, as a source of the alkali metal;

heating the alkali metal generating agent; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the secondary-electron emitting surface.

Claim 71 (Previously Presented): A method of production of an electron tube comprising an electron multiplying part comprised of one or more dynodes each having a secondary-electron

emitting surface for emitting secondary electrons corresponding to an incident electron, said method comprising the steps of:

preparing an alkali metal generating device according to claim 44, as a source of the alkali metal;

heating the alkali metal generating agent housed in the case of the alkali metal generating device; and

guiding the alkali metal generated by the heating of the alkali metal generating agent, to an area for formation of the secondary-electron emitting surface.

Claim 72 (Previously Presented): A method of production of an electron tube according to claim 70, wherein said electron tube comprises one selected from a photomultiplier tube, an image tube, and a streak tube.

Claims 73-139 (Canceled).